

transfecting said cells at a second stage of the cell cycle within about one cell cycle of said first stage with a nucleic acid that encodes a desired gene product.

2. A method of claim 1 wherein said high energy electromagnetic radiation synchronizes cells at a stage of the cell cycle when the nuclear membrane is substantially degraded.

3. A method of claim 1 wherein said high energy electromagnetic radiation synchronizes cells at late S phase.

4. A method of claim 1 wherein said high energy electromagnetic radiation synchronizes cells at the G<sub>2</sub>/M phase boundary.

5. A method of claim 1 wherein said high energy electromagnetic radiation synchronizes cells at a stage other than M phase, and the nucleic acid accumulates in cells that have cycled to the G<sub>2</sub>/M phase boundary.

10. (Amended) A method of claim 1 wherein said nucleic acid is fully encapsulated in a lipid-nucleic acid particle.

11. The method of claim 1 wherein said high energy electromagnetic radiation is a member selected from the group consisting of Gamma rays, X-rays, and ultraviolet rays.

12. The method of claim 11 wherein said high energy electromagnetic radiation is X-rays.

### REMARKS

#### The Invention

The present invention relates to methods for increasing the efficiency of the transfection of cycling cells. The methods involve synchronizing cells at a first stage of the cell cycle, and transfecting the cells at a second stage of the cell cycle within about one cell cycle of the first stage with a nucleic acid.